A.D. 1787 . . . . N° 1608.

SPECIFICATION

OF

WILLIAM PURNELL.

MANUFACTURE OF IRON.

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PURNELL'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, William Purnell, of Dursley, in the County of Gloucester, Iron Master, one of the surviving Partners of John Purnell, late of Froom Bridge Mills, in the Parish of Frampton-upon-Severn, in the same County, Iron Master, deceased, send greeting.

WHEREAS His most Excellent Majesty King George the Third, did, by His Letters Patent under the Great Seal of Great Britain, bearing date the Fifth day of June, in the twenty-seventh year of His reign, give and grant unto me, the said William Purnell, His especial licence that I, the said William Purnell, during the term of years therein expressed, should and lawfully might use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, an Invention, communicated to me by the said John Purnell, of "An Entire New Mode, Method, or Art of Preparing, Shingling, and Welding Iron with Pit Coal from the Ore, as also from Sow or Pig Metal and every other Sort of Cast Iron, entirely by the Application of a Machine constructed and applied as to render it of a Superior Quality, and in much Greater Quantities, and with a very Considerable less Expence of Fuel and Waste of Metal than hath hitherto been done by any Method yet used;" in which said Letters Patent there is contained a proviso, obliging me, the said William Purnell, under my hand and seal, to cause a particular description of the nature of the said Invention, and how the same is to be performed, to be inrolled in His Majesty's High Court of Chancery within one calendar month after the date of the said recited Letters Patent, as in and by the same (relation being thereunto had) may more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said William Purnell, do hereby declare that the said Invention, and manner of performing the same, is described and ascertained in manner following (that is to say):—

For the preparing, manufacturing, and working of iron from the ore, as well as from sow and pig metal, and also from every other sort of cast iron, I use the common air or reverberatory furnace in manner as is practised at the common iron foundaries, in which the metal must be brought into the most equable and perfect state of fusion, by being agitated here and there in the fire, so that every part may receive such effect from it that not the smallest particle may remain unmelted or in an unfused state; and after that is compleated, the heat must be abated by slow degrees (still keeping it stirred and separated), so that as it cools gradually it may be taken from the furnace in lumps, loops, or pieces of about the weight of fourteen pounds, more or less, (as it may happen, or as the power of the rollers, herein-after described, may best overcome,) on shovels, made light, with their edges turned up and rather dished in the middle, the better to prevent the hot metal falling off whilst conveying from the furnace mouth to a cast-iron plate placed on the floor between the furnace mouth and rollers, on which it must be laid down to receive a few blows from a common sledge hammer by a labourer, placed ready for that purpose, to bring it into somewhat of the shape of a wedge; when it must with all possible dispatch be taken up by a man, who must attend before the rollers with a like shovel, or other such tool or instrument to that before described, and conveyed to an iron plate, placed nearly in a direct line with the center of a pair of iron rollers, sixteen inches long by fifteen inches in diameter, or of such other dimensions as the force of the machinery used may render it necessary, to be worked by steam, fire, or water, on which plate it is laid, and a blow or blows must be instantly given it by the edge of the said shovel or other such tool against the thickest edge or side, the better to force it to enter betwixt the rollers (always observing that the thin edge of the lump or loop be presented to pass first); and whilst this first lump or loop is passing betwixt the rollers and falling into a cistern through which a continual stream of water is made to pass, another such lump or loop must be prepared and brought forward in regular succession, till the whole charge of one furnace be rolled, which in quantity may be from three to five hundredweight, more or less, and which may be made to pass between the said iron rollers in about fifteen minutes, which in the common method used would take up much longer time and be attended with a greater expence. But should a still greater dispatch in the rollers be required, a much larger quantity may be made to pass between a pair of rollers in the same given time, by working them abreast or parralel to each other, and letting the lumps or loops fall between the rollers whilst in motion, aided by a slight blow from a light sledge hammer, or even generally by its own weight, in which latter case the dispatch will be equal to the expedition with which the metal can be made to pass to the rollers, either by means of the shovels, as before described, or by iron troughs and rakes, to convey it from the furnace to the rollers; the furnaces to be placed in the most convenient situation to the rollers, that the hot metal may have but a short distance to be conveyed to them from the furnaces, that it may pass between them in a proper state of heat, so that the rollers, by their superior force and uniform pressure on all the parts of the crude metal, may squeeze, force out, and separate from the true metallic part the greatest possible quantity of cinder or obnoxious unmetalic earth, and which it does in a much superior degree to any tilting forge or other hammer and anvil, be their weight or force what it may, as I have experienced; or any other method now practised, or that has been practised, and which renders the metal so worked and refined by this my new invented method, of passing it whilst in fusion through a pair of rollers instead of shingling under a tilting forge or other hammer, or any other method now in use, perfectly pure and free from any obnoxious particles that by every other process that have hitherto been used is in some degree left behind and worked up in the interstices of the metal, by which it never acquires so great a degree of maleability and durtility as by my new discovered method of applying rollers for the purpose of shingling and preparing iron for the balling forge, instead of the method of stamping and shingling with the tilting forge or other hammer, or any other method that is or hath been hitherto practised.

In witness whereof, I, the said William Purnell, have hereunto set my hand and seal, the Twenty-seventh day of June, in the year of our Lord One thousand seven hundred and eighty-seven.

WILL^M (L.S.) PURNELL.

Sealed and delivered (being first duly stampt) in the presence of

WILL. VIZARD.

Vizard, Extra.

AND BE IT REMEMBERED, that on the Twenty-seventh day of June, in the year of our Lord 1787, the aforesaid William Purnell came before our said Lord the King in His Chancery, and acknowledged the Specification aforesaid, and all and everything therein contained and specified, in form above written. And also the Specification aforesaid was stampt according to the tenor of the Statutes made for that purpose.

Inrolled the Third day of July, in the year of our Lord One thousand seven hundred and eighty-seven.

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